

SPANISH MYXOMYCETES. VIII. SOME NIVICOLOUS MYXOMYCETES FROM CENTRAL SPAIN

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ABSTRACT - Six species of myxomycetes associated with *Pinus sylvestris* vegetation near melting snow were collected from the Sierra de Guadarrama (province of Segovia) and studied. *Trichia sordida* var. *sordidoides* is proposed as a new variety and *Comatricha chionophila* as a new combination. *Trichia bicolor* and *Trichia contorta* var. *engadinensis* are considered to represent the same taxon as *Trichia sordida*. *Comatricha alpina* is new to Spain.

KEY WORDS : Taxonomy, chorology, myxomycetes, Spain.

INTRODUCTION

The nivicolous Myxomycetes have been poorly known in our country. As far as we know only Gracia (1986, 1987) and Lado (1992) have published on them up to now.

A microclimate favourable for the fruiting of some species myxomycetes is created on dead and living vegetation covered by melting old snow. The fructifications of nivicolous species can be numerous, but their period of fruiting is short, and they are typically spring species. During the spring of 1991 and 1992, we visited the Sierra de Guadarrama in the centre of Spain and collected some myxomycetes which were growing on *Pinus sylvestris* vegetation covered for a time by melting snow. Four of six observed taxa are thought to be typically nivicolous species: *Comatricha alpina* Kowalski, *C. chionophila* (Lado) Moreno, *Lamproderma sauteri* Rostaf., and *Trichia sordida* var. *sordidoides* Illana & Moreno. Incidentally nivicolous (we think) are *Dianema corticatum* Lister and *Enerthenema melanospermum* Macbride & Martin; they are rare species in Spain.

Microphotographs of spores and capillitium prepared with the critical point method, were made under a Zeiss-DSM 950 SEM and under a Labophot Nikon photomicroscope. Microscopic examinations were made of material mounted in water or Hoyer's medium.

The material examined has been deposited in the herbarium of the Department of Plant Biology (Botany) of the University of Alcalá de Henares (AH).

Comatricha alpina Kowalski, Madroño 22: 152. 1973. (Figs. 1-2)

= *C. suksdorfii* var. *aggregata* Meylan, Bull. Soc. Vaud. Sci. Nat. 53: 455. 1921.



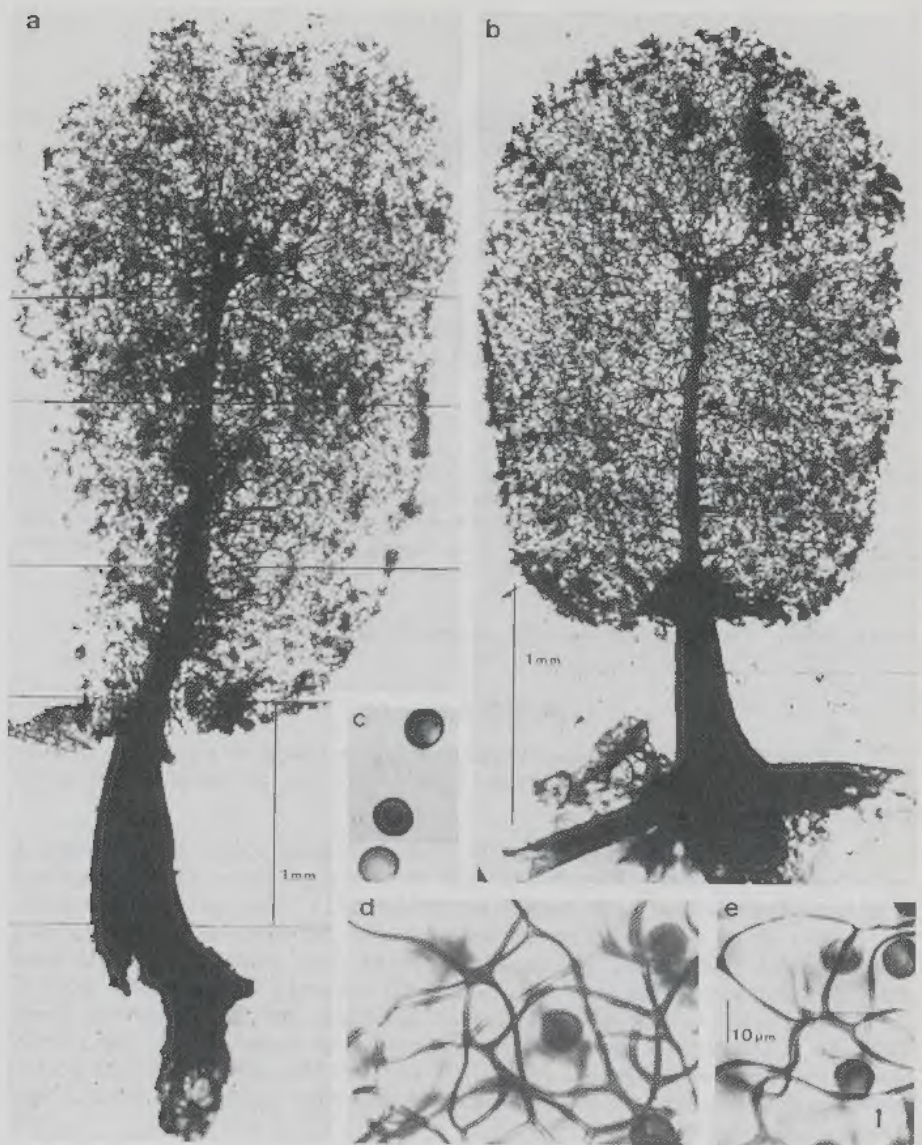


Fig. 1. *Comatricha alpina* Kowalski, (AH 13453), a-b: sporocarps, c: spores, d-e: capillitium.

Collections examined. SEGOVIA: On fallen trunks and dead branches of *Pinus sylvestris*, near melting snow, Sierra de Guadarrama, mountain pass of Los Cotos, alt. 1900 m., 31.V. 1991, leg.: A. Castillo, G. Moreno, E. Valenzuela & C. Ochoa, AH 13453.

Our collection consists of about 20 sporocarps. These are densely aggregated, 3-4 mm tall, their sporophores are black, ovoid to cylindrical, about 1.6 diam, 2-3 mm

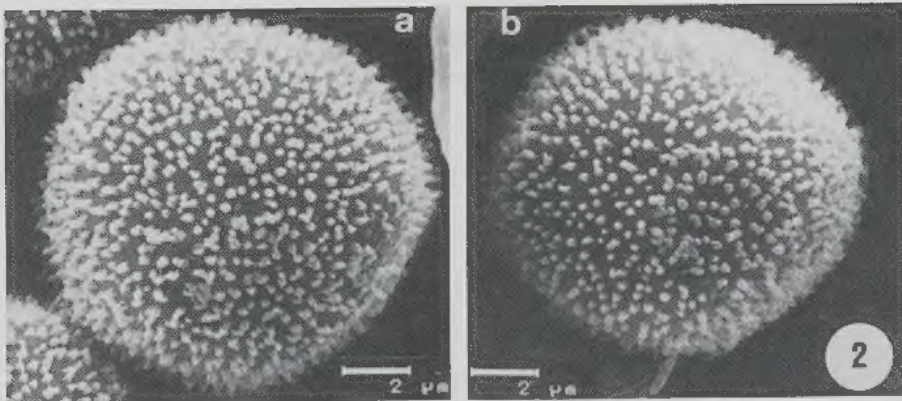


Fig. 2. *Comatricha alpina* Kowalski, (AH 13453), a-b: spores under the SEM.

long, and their stalks are black and opaque and about 1 mm long. The peridium leaves only a small violet-brown collar at the base of the collumella. The collumella is black and opaque, and reaches about 2/3 the way up the sporophore and is rather sturdy throughout, ending abruptly in a few capillitial branches. The capillitium is dark, dense and strongly anastomosed. The spores are black in mass, dark brown in transmitted light with a pale area, 10-12(13) μm in diam., densely and minutely warted. SEM, however, shows that the "warts" are in fact baculae with irregular apices.

Comatricha alpina is a typically nivicolous species close to *C. suksdorfii* Ellis & Ev., and it can further be segregated by its densely aggregated (touching) smaller sporocarps on shorter stalks. *Comatricha suksdorfii* has loosely gregarious or scattered sporocarps, 7-8 mm tall and stalks about 4 mm long (Kowalski, 1972, 1975; Meyer, 1986).

Comatricha suksdorfii has been cited previously from Spain by Gracia (1986), but *C. alpina* is a new contribution to the national catalogue of myxomycetes.

***Comatricha chionophila* (Lado) Moreno, comb.nov. (Fig. 3)**

≡ *Collaria chionophila* Lado, *Anales Jard. Bot. Madrid* 50: 9-11. 1992.

Collections examined. SEGOVIA: On fallen trunks and dead branches of *Pinus sylvestris*, near melting snow, Sierra de Guadarrama, mountain pass of Los Cotos, alt. 1900 m., 31.V.1991, leg.: A. Castillo, G. Moreno, E. Valenzuela & C. Ochoa, AH 13441. Idem, 6.VI.1991, leg.: A. Castillo, G. Moreno & C. Illana, AH 14569.

Recently, Lado (1992) described a new species of *Collaria*, characteristically found in nivicolous environments. The habitat and some locality and collection data were the same as ours. We add M.O. photographs of sporocarps and capillitium to complement the morphological studies made before.

We prefer following the classical concept of recognizing the genus *Comatricha*, including within it those species assigned to the genus *Collaria*. Thus, we make the appropriate new combination.

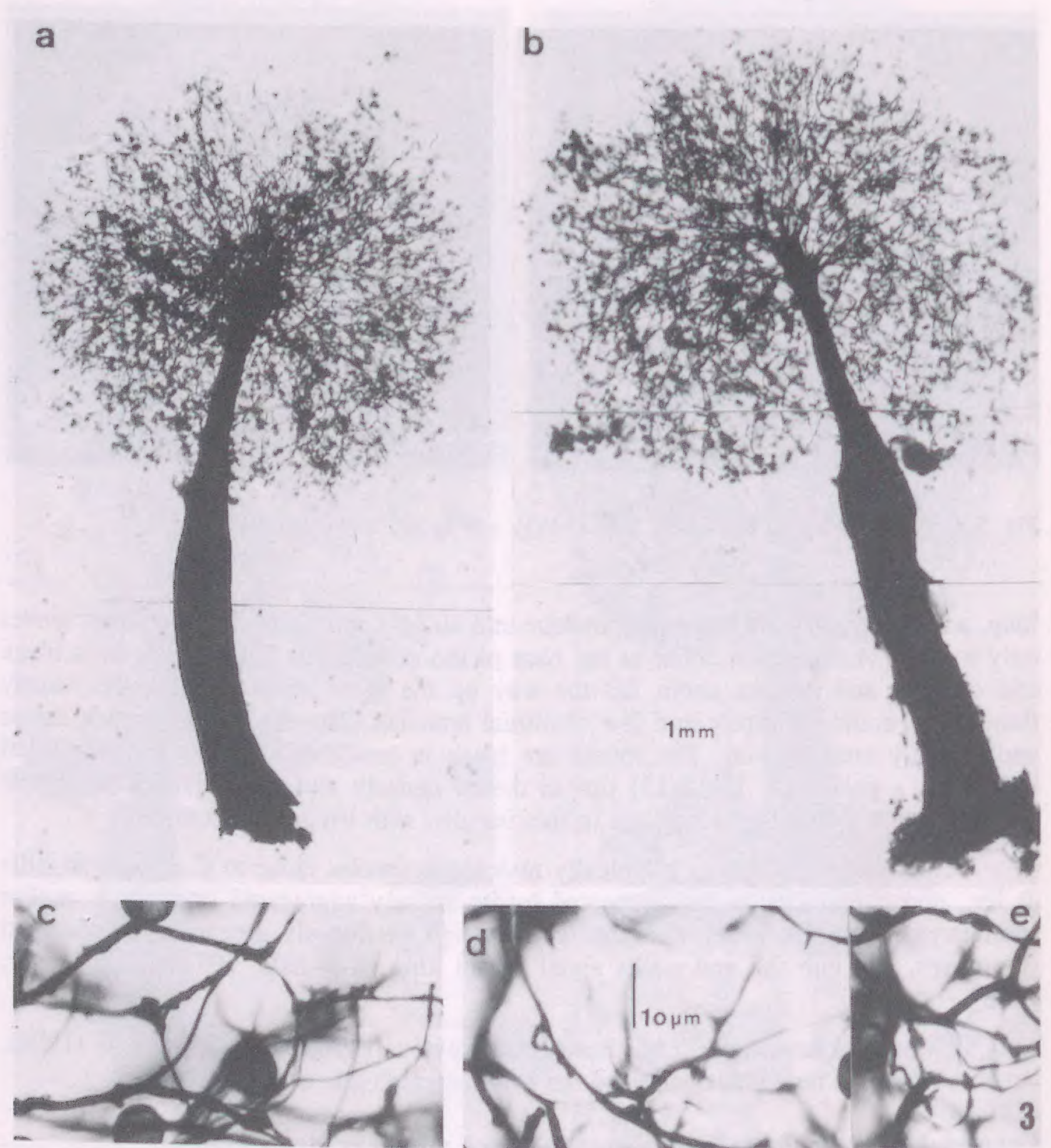


Fig. 3. *Comatricha chionophila* (Lado) Moreno, (AH 13441), a-b: sporocarps, c-e: capillitium.

***Dianema corticatum* Lister, Monogr. Mycetozoa 205. 1984.**

Collections examined. SEGOVIA: On dead branches of *Pinus sylvestris*, Sierra de Guadarrama, mountain pass of Los Cotos, alt. 1900 m., 6.VI.1991, leg.: G. Moreno, E. Valenzuela, A. Castillo & C. Illana, AH 13467. Idem, 10.IV. 1992, leg.: A. Castillo & G. Moreno, AH 14545 y 16088.

This species has been collected in Spain only twice: in the province of Tarragona (Gracia, 1977) on *Populus alba* and in Huesca (Carilla & Gracia, 1991) on *Ficus carica* in a moist chamber culture. In both cases the spiral ornamentation of the capillitium is lacking.

Enerthenema melanospermum Macbride & Martin, *J. Wash. Acad. Sci.* 22: 91. 1932.

Collections examined. SEGOVIA: On dead branches of *Pinus sylvestris*, Sierra de Guadarrama, mountain pass of Los Cotos, alt. 1900 m., 6.VI.1991, leg.: A. Castillo, G. Moreno, C. Illana & E. Valenzuela, AH 13464.

Enerthenema melanospermum is characterized by its columella ending in a rather wide membranous brown funnel on the periphery and by its dark, with a pale side, spinulose spores, 13-15 μm in diam. It was previously recorded in Spain from the province of Lerida (Gracia, 1977).

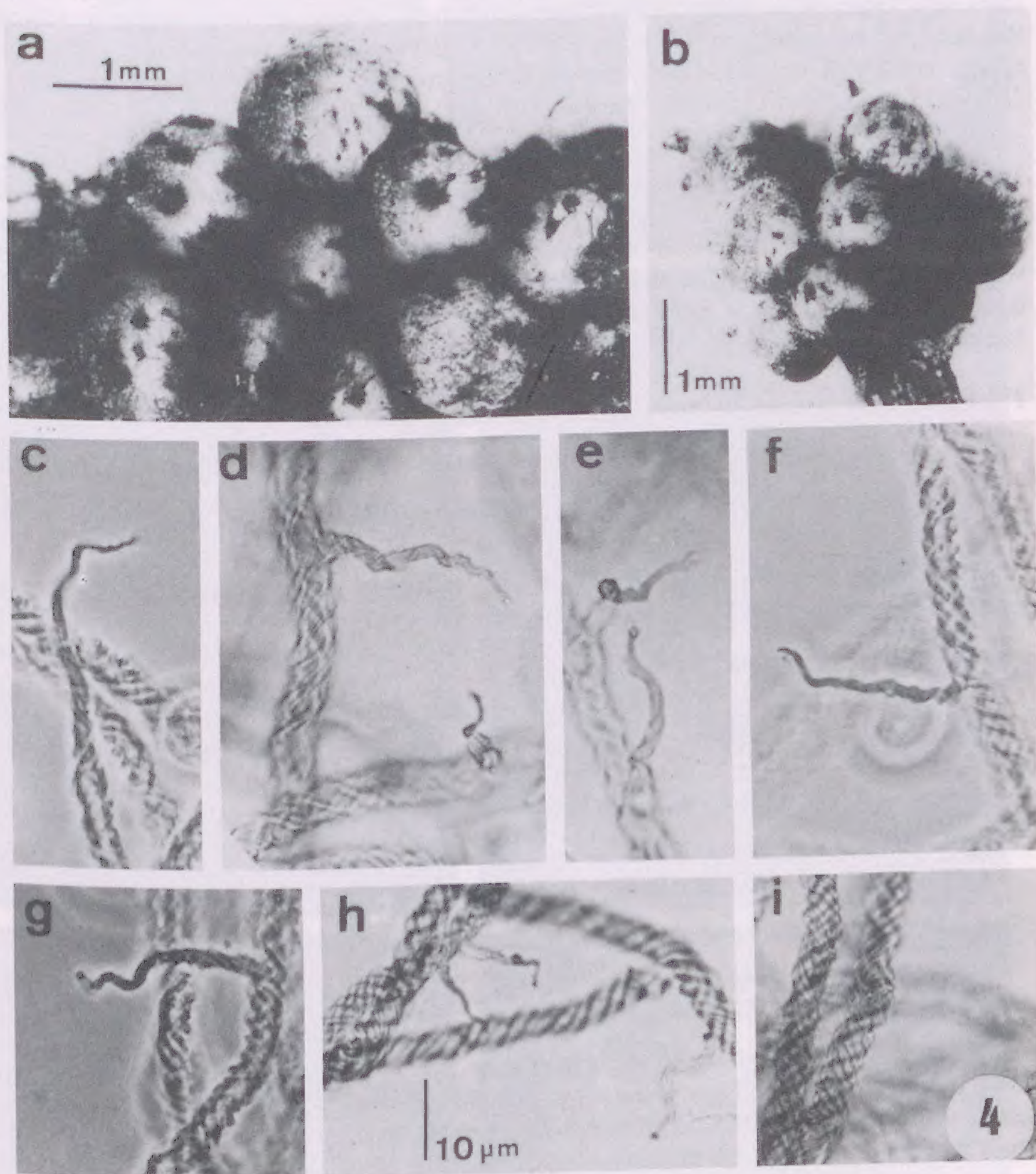


Fig. 4. *Trichia sordida* var. *sordidoides* Illana & Moreno (typus), a-b: sporocarps, c-i: capillitium.

***Lamproderma sauteri* Rostaf., Sluzowce Monogr. 205. 1874.**

Collections examined. SEGOVIA: On dead branches and leaves of *Pinus sylvestris* and the stem of *Cytisus oromediterraneus* near melting snow, Sierra de Guadarrama, mountain pass of Los Cotos, alt. 1900 m., 31.V.1991, leg.: G. Moreno, E. Valenzuela, A. Castillo & L.G. Montero, AH 13440, 13444, 13445, 13446, 13447, 13451 and 14501. Idem. 6.VI.1991, leg.: C. Illana, A. Castillo, E. Valenzuela & G. Moreno, AH 13464, 13465, 13468, 13469, 13591, 13592, 14502, 14503 and 14504.

Our collections are characterized by their 2-5 mm tall sporocarps, globose sporophores, 2-2.5 mm diam, and short, about half the total height, black stalks on a well developed hypothallus. The peridium is membranous, persistent, blue with silvery reflections, and which tears irregularly from apex to base, where pieces persist in the form of a large collar. The columella is dark brown or opaque, long, almost reaching the apex of the sporophore. The capillitium is dense, dark but paler outwards. The spores are black in mass, dark brown in transmitted light with a small pale area, (13)14-15 μ m in diam., densely warted.

This nivicolous species was recorded before in Spain from Lerida (Gracia, 1986). Most *Lamproderma* species are found at high altitudes in the mountains, where they are often abundant and show great diversity (Kowalski, 1968). In Switzerland, Meylan made many collections of *L. sauteri* and described six varieties; most of these were not recognized by Kowalski (1975) who suggests that the differences are relatively minor and thus not sufficient to recognize separate taxa; therefore *L. sauteri* is a variable species.

***Trichia sordida* var. *sordidoides* Illana & Moreno var. nov. (Figs. 4-5)**

Diagnosis: *A typo differt capillitium "hemitrichioide" non "trichioide"*.

Etymology: From the latin "sordidoides" similar to *Trichia sordida* Johannesen.

Habitat: on *Pinus sylvestris*, mountain pass Los Cotos (Segovia), 31.V.1991, leg.: L.G. Montero, A. Castillo & G. Moreno, AH 13442.

Collections examined:

Trichia contorta var. *sordidoides*. SEGOVIA: On fallen trunks, leaves and cones dead of *Pinus sylvestris*, near melting snow, Sierra de Guadarrama, mountain pass of Los Cotos, alt.1900 m., leg.: L.G. Montero, A. Castillo & G. Moreno, 31.V.1991, AH 13442 Holotypus, 13443 and 13449. Nowotny 1714(1) -Austria-. Meyer 3280 -France-.

T. bicolor Stephenson & Farr, holotypus (BPI).

Trichia contorta var. *engadinensis* Meylan, lectotypus (LAU).

T. sordida Johannesen, holotypus (0). Nowotny no. 1714(2), 2225 and 4468 -Austria-. Meyer no. 3611 -France-.

Sporocarps clustered and aggregated. Sporophores globose to subglobose, 0.4-1 mm diam., sessile, or on short thick stalks. Hypothallus dark brown to reddish, continuous under a colony. Peridium single, membranous, the upper part showing dark lines and rounded or irregularly star-shaped maculae consisting of particle deposits on a dark ochraceous background, the base dark red, in transmitted light the peridium is minutely irregular striated within and shows rounded depressions; dehiscence irregular.

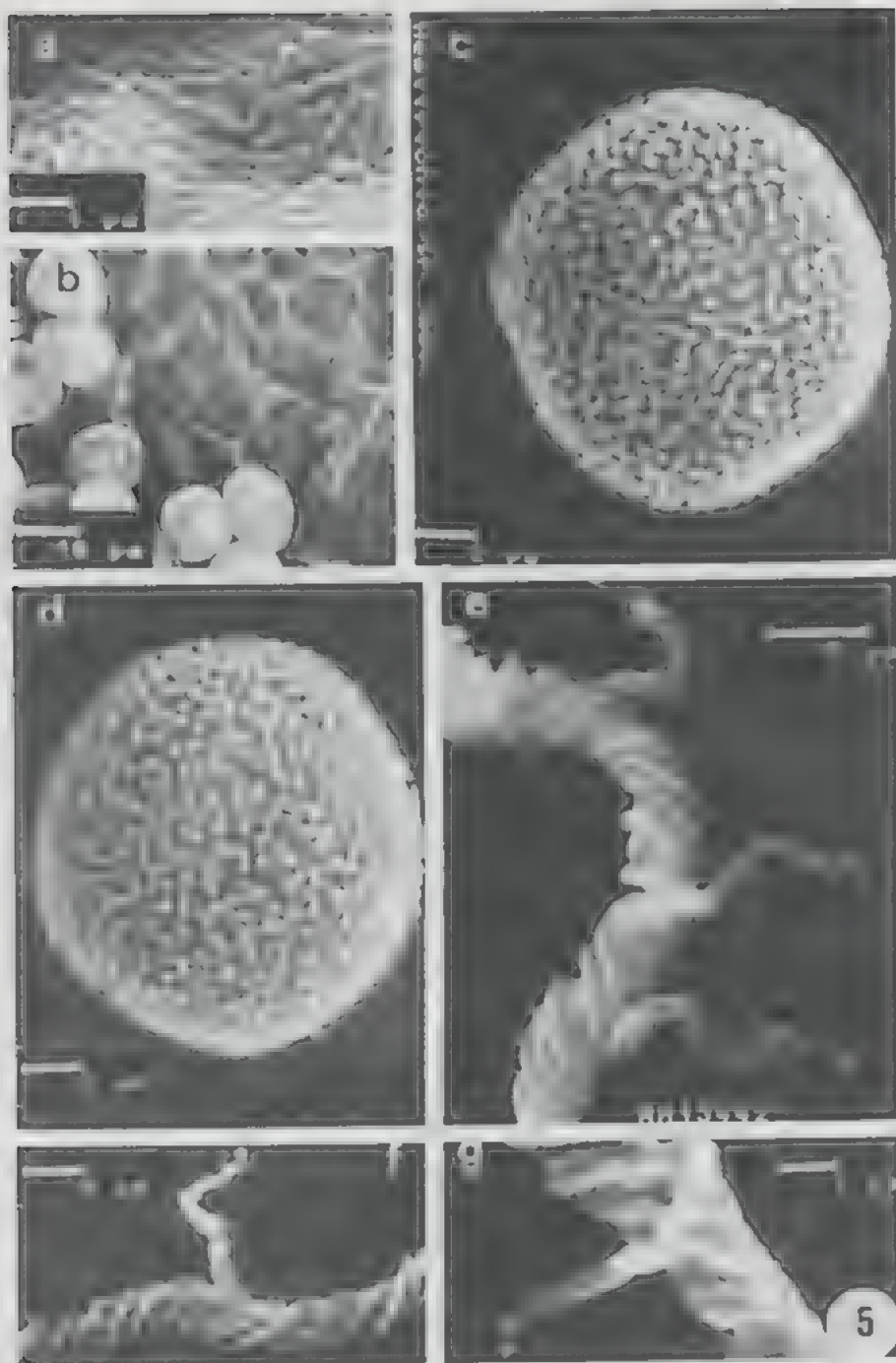


Fig. 5. *Myxoglossina* sp. nov. (Hán & Molecová): a-b) perithecia, c-h) spores under the SEM, e-g) capillitium

The capillitium is formed by elaters, profuse, long, tips tapering, yellow, 5-6 μm in diam., ornamented with 4-5 spirals, with many short, thinner, tapering lateral branchlets. The spores are yellow in mass, pale yellow in transmitted light, globose to subglobose, 12-15 μm diam., very densely warted.

Examination by SEM shows that the individual "warts" have a flat apex and a narrowed base, so that they are in reality piles (Rammeloo, 1974; Saenz, 1978); these

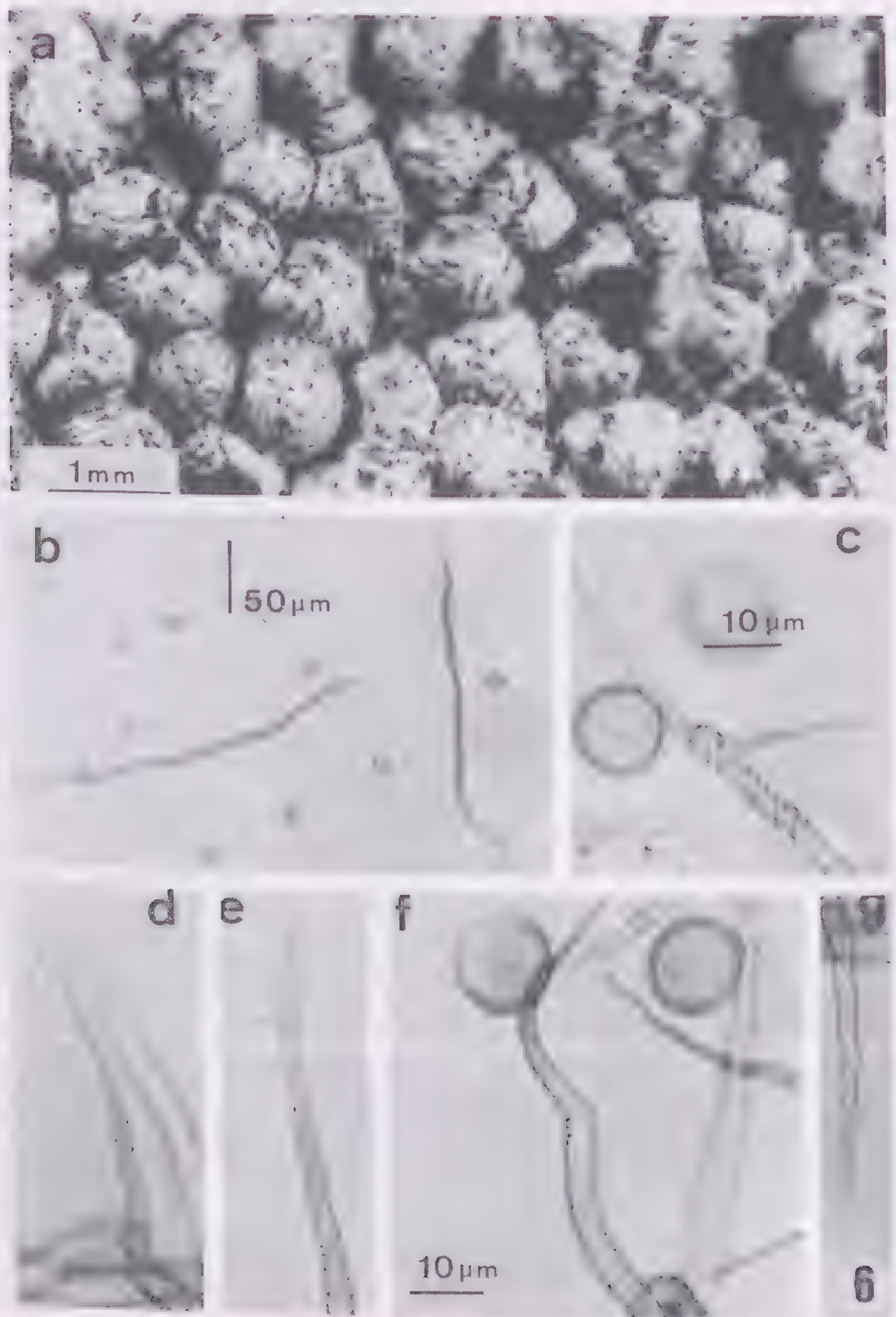


Fig. 6. *Trichia sordida* Johannesen (typus), a: sporocarps, b-g: capillitium and spores.

are very dense and many are confluent in rows and small clusters. The peridium shows crateriform depressions, possibly spore impressions, and is irregularly reticulate from minute wrinkles, like the peridium of *Hemitrichia montana* (Morgan) Macbride (Rammeloo, 1984).

The proposed variety is like var. *sordida* (Figs. 6-7) in its habitat (nivicolous). Moreover, the two varieties look alike and they are identical in peridial structure and spore size. They differ only in the capillitium: in var. *sordidoides* the elaters are long and show few free ends, and bear many, short, tapering secondary branchlets. The var. *sordida* has short elaters with many free ends, and scanty secondary branchlets (Fig. 5a).

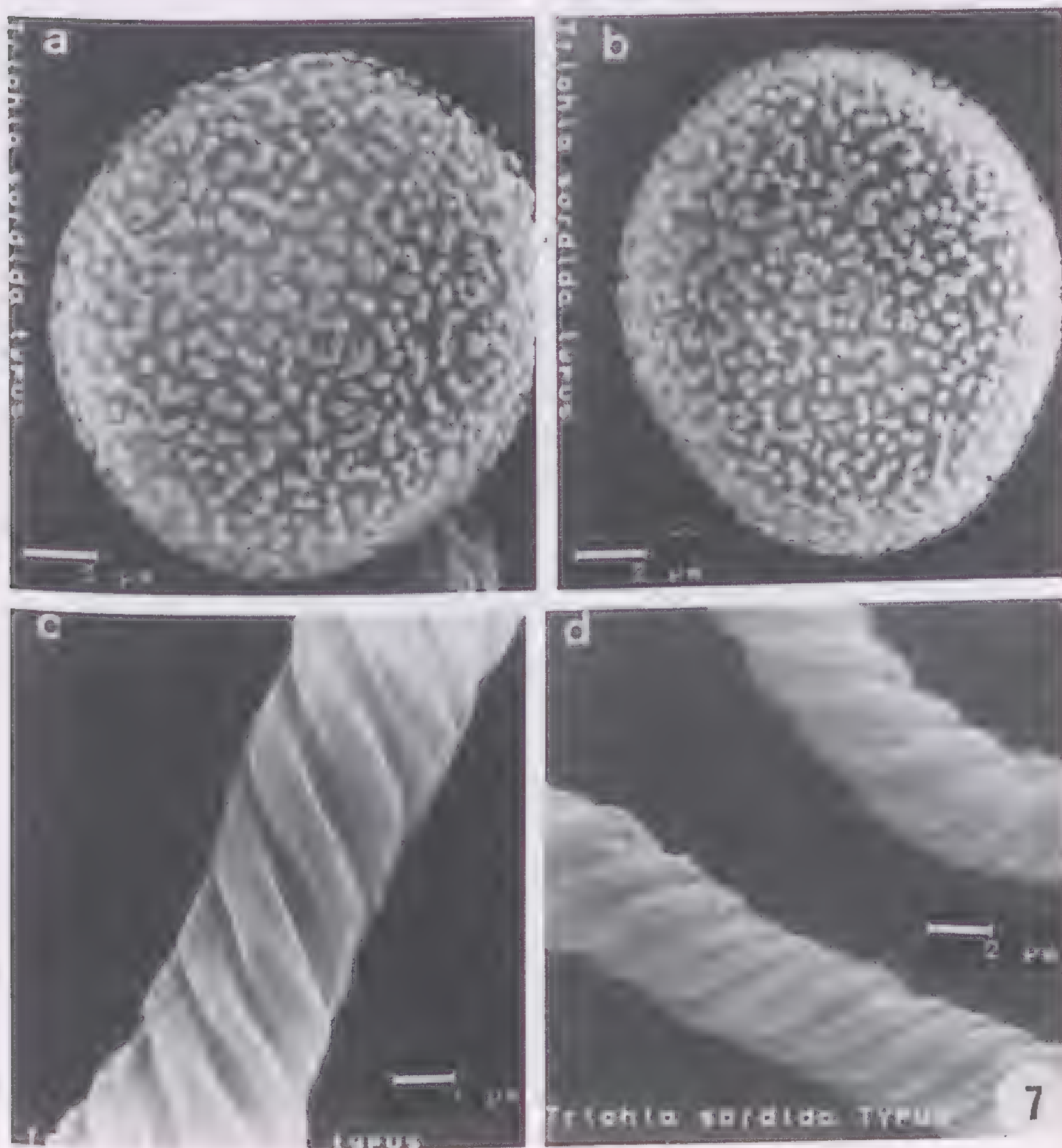


Fig. 7. *Trichia sordida* Johannesen (typus), a-b: spores under the SEM, c-d: capillitium.

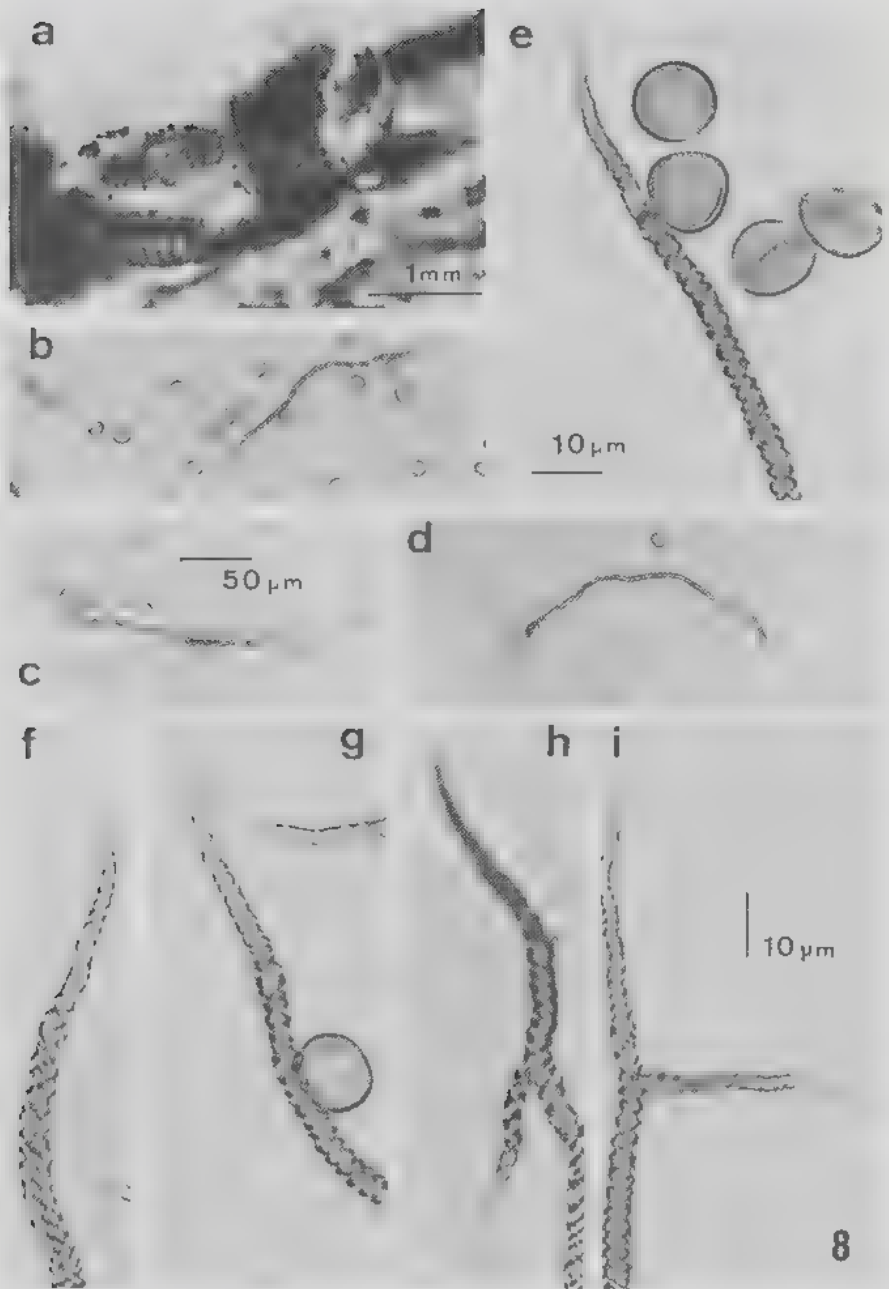


Fig 8 *Trichia bicolor* Stephenson & Farr (typus), a- sporocarps, b-i capillitium



Fig. 1. *Boletaria septigena* & *Eurotium apiculatum* (see text for details). c, d, sporangia under SEM, e, f, capillitium

We found that *Trichia contorta* var *engadinensis* Meylan (1921) is very like *T. sordida* it is also nivicolous and was originally described as having globose to ovoid, 1.2 mm in diam, sessile sporophores and a brown peridium. However, Kowalski (1975) described the peridium of the type as speckled, and we were able to verify this ourselves in the, mostly badly squashed, peridia, the maculae observed were very like those of *T. sordida* but less pronounced in the upper part. As were the microscopical features: short elaters with many free ends and spores 12-14(-15) μm diam, similarly decorated.

Trichia bicolor Stephenson & Farr (1990) is very much like *T. sordida*, the type (Figs 8-9) consists of a dozen sessile sporocarps, in small scattered groups. Its sporophores are subglobose to ellipsoidal. The peridium is yellow ochraceous with red lines and spots above and with a dark red base. The microscopical features are like those of *T. sordida*, too except for the larger diameter (5.5-6.5 μm) of the elaters.

From Austria we were able to study nivicolous specimens kindly lent by Mr Nowotny, of which no. 1714(2) was particularly interesting, as it showed a gradation in macroscopic features between *T. bicolor* and *T. sordida*. Because of these observations, we are agreed that the three taxa of which we have studied the types should be included in only one species viz *Trichia sordida* Johannesen, *Mycotaxon* 20: 81-82 1984, (= *T. contorta* var. *engadinensis* Meylan, *Bull. Soc. Vaud. Sc. Nat.*, 53: 460 1921, = *T. bicolor* Stephenson & Farr, *Mycologia* 82: 513 1990). The main macroscopic and microscopic characters are summarized in Figs. 6-9.

For some authors (Kowalski, 1975; Meyer, 1986), *Trichia contorta* var. *engadinensis* is a form 'trichioide' of *Hemitrichia montana* (Morgan) Macbr. *Hemitrichia montana* has brown-ochraceous sporocarps without the typical stains, it resembles macroscopically *H. clavata* with the exception of the stalk. Rammeloo (1989) studied this problem, adding data and SEM photographs.

Hemitrichia montana differs from *T. sordida* by its capillitium not consisting of free elaters and not bearing short lateral branchlets, and by its evenly brown ochraceous peridium.

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